

CLAIMS

What is claimed is:

1. A method of controlling drive of a function liquid droplet ejection head having disposed therein a plurality of nozzle arrays with a different function liquid droplet ejection amount per unit nozzle,

wherein, in one print cycle, drive of the plurality of nozzle arrays is controlled by using a single drive signal having a plurality of ejection pulses corresponding to the plurality of nozzle arrays.

2. The method according to claim 1, wherein the plurality of ejection pulses have waveforms which are different from each other in accordance with specifications of corresponding nozzle arrays.

3. The method according to claim 1, wherein drive of the plurality of nozzle arrays is controlled by using an identical ejection pulse in case of performing flushing which is function recovery processing by waste discharging of liquid droplets from all nozzles.

4. The method according to claim 1, wherein the drive signal has a micro oscillation pulse which subjects a function liquid to form a meniscus of each nozzle to micro oscillation, and wherein only one waveform of the micro oscillation pulse is inputted in said one print cycle.

5. The method according to claim 4, wherein the micro oscillation pulse is inputted before input of the plurality of ejection pulses in said one print cycle.

6. The method according to claim 1, wherein the drive signal has a damping pulse for damping residual oscillation of a pressure generating element which generates pressure fluctuations in a cavity communicated with each nozzle, and wherein, in said one print cycle, the damping pulse is inputted after input of the plurality of ejection pulses and has a waveform corresponding to a waveform of the last inputted ejection pulse.

7. The method according to claim 1, wherein the plurality of nozzle arrays include a first nozzle array which ejects a first function liquid droplet ejection amount and a second nozzle array which ejects a second function liquid droplet ejection amount which is smaller than the first function liquid droplet ejection amount, and wherein a number of nozzles in the second nozzle array is two times the number of nozzles in the first nozzle array.

8. A function liquid droplet ejection apparatus which selectively ejects function liquid droplets while performing a relative movement between a function liquid droplet ejection head into which a function liquid is introduced and a workpiece, the apparatus comprising:

the function liquid droplet ejection head having disposed therein a plurality of nozzle arrays with a different function liquid droplet ejection amount per unit nozzle; and

control means for controlling drive of the plurality of nozzle arrays by using a single drive signal,

wherein the drive signal has a plurality of ejection pulses corresponding to the plurality of nozzle arrays in one print cycle.

9. The apparatus according to claim 8, wherein the plurality of ejection pulses have waveforms which are different from each other in accordance with specifications of corresponding nozzle arrays.

10. The apparatus according to claim 8, wherein said control means controls the plurality of nozzle arrays by using an identical ejection pulse in case of performing flushing which is function recovery processing by waste discharging of liquid droplets from all nozzles.

11. An electro-optic device manufactured by using the function liquid droplet ejection apparatus according to claim 8.

12. A method of manufacturing a liquid crystal display device, in which a multiplicity of filter elements are formed on a color filter substrate by using the

function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing filter materials of respective colors into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the filter materials, whereby the multiplicity of the filter elements are formed.

13. A method of manufacturing an organic EL device, in which an EL layer is formed in each of a multiplicity of picture element pixels on a substrate by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing luminescent materials of respective colors into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the luminescent materials, whereby the multiplicity of EL layers are formed.

14. A method of manufacturing an electron emission device, in which a multiplicity of phosphors are formed on electrodes by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing fluorescent materials of respective colors into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the electrodes to selectively eject the fluorescent materials, whereby the multiplicity phosphors are formed.

15. A method of manufacturing a PDP device, in which phosphors are formed in each of a multiplicity of concave portions on a rear substrate by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing fluorescent materials of respective colors into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the rear substrate to selectively eject the fluorescent materials, whereby the multiplicity of the phosphors are formed.

16. A method of manufacturing an electrophoretic display device, in which migrating bodies are formed in each of a multiplicity of concave portions on electrodes by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing migrating body materials of respective colors into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the electrodes to selectively eject the migrating body materials, whereby the multiplicity of the migrating bodies are formed.

17. A method of manufacturing a color filter, in which a color filter having disposed therein a multiplicity of filter elements is manufactured by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing filter materials of respective colors in the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the filter materials, whereby the multiplicity of the filter elements are formed.

18. The method according to claim 17, wherein an overcoat film which covers the multiplicity of filter elements is formed, said method further comprising the steps of:

introducing, after the filter elements are formed, a translucent coating material into the function liquid droplet ejection head; and

performing relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the coating material, whereby the overcoat film is formed.

19. A method of manufacturing an organic EL in which a multiplicity of picture element pixels inclusive of EL layers are arranged on a substrate, by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

- introducing luminescent materials of respective colors into the function liquid droplet ejection head; and

- performing relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the luminescent materials, whereby the multiplicity of EL layers are formed.

20. The method according to claim 19, wherein a multiplicity of pixel electrodes corresponding to the EL layers are formed between the multiplicity of EL layers and the substrate, said method further comprising the steps of:

- introducing a liquid electrode material into the function liquid droplet ejection head; and

- performing relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the liquid electrode material, whereby a multiplicity of the pixel electrodes are formed.

21. The method according to claim 20, wherein a counter electrode is formed so as to cover the multiplicity EL layers, said method further comprising the steps of:

introducing, after the EL layers are formed, the liquid electrode material into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the liquid electrode material, whereby the counter electrode is formed.

22. A method of forming a spacer, in which a multiplicity of particulate spacers are formed to constitute a minute cell gap between two substrates, by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing a particle material constituting the spacers into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and at least one of the substrates to selectively eject the particle material, whereby the spacers are formed on the substrate.

23. A method of forming a metallic wiring on a substrate by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing a liquid metal material into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the liquid metal material, whereby the metallic wiring is formed.

24. A method of forming a lens, in which a multiplicity of microlenses are formed on a substrate, by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing a lens material into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the lens material, whereby the multiplicity of microlenses are formed.

25. A method of manufacturing a resist of an arbitrary shape on a substrate by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing a resist material into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the resist material, whereby the resist is formed.

26. A method of forming a light diffusion body, in which a multiplicity of light diffusion bodies are formed on a substrate, by using the function liquid droplet ejection apparatus according to claim 8, the method comprising the steps of:

introducing a light diffusion material into the function liquid droplet ejection head; and

performing a relative scanning between the function liquid droplet ejection head and the substrate to selectively eject the light diffusion material, whereby the multiplicity of light diffusion bodies are formed.